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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/884,640	06/19/2001	Nicholas F. Borrelli	SP01-087	2658

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EXAMINER	
CURTIS, CRAIG	
ART UNIT	PAPER NUMBER
2872	

DATE MAILED: 11/12/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/884,640	BORRELLI ET AL.	
	Examiner	Art Unit	
	Craig H. Curtis	2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 October 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *9-15 and 26-31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *9-15 and 26-31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Disposition of the Instant Application

- This Office action is responsive to Applicants' Amendment B filed on 17 October 2003 and made of record in the file as Paper No. 9.
- By this amendment, Applicants have canceled claims 16-25 and have newly added claims 26-31.
- Claims 9-15 & 26-31 are currently pending in the instant application.
- The Examiner sincerely regrets having to inform Applicants that further searching of the prior art subsequent to Applicants' filing of Amendment B resulted in the discovery of references of considerable relevance with respect to the claims of the instant invention. In light of this discovery, the Examiner regrettably must withdraw the previously indicated allowability of claims 9-15. The Examiner sincerely regrets any inconvenience this development may present for the Applicants.
- The finality of the Office action mailed to Applicants on 3 September 2003 has been withdrawn, and new grounds for rejection of the claims are set forth in detail below.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Faris (6,384,971) in view of Visovsky et al. (6,375,870) and Kurtz et al. (6,532,111).

With regard to claim 9, Faris discloses (see, e.g., Figs. 5A-5E) the invention as claimed--[a] method for fabricating a wire grid (see Fig. 1B) polarizer, comprising:

depositing a wire grid material (20) on a substrate (4) (see Fig. 5A);

depositing a resist film (6) on the wire grid material (see Fig. 5B)--EXCEPT FOR explicit teachings of the following additionally recited limitations:

bringing a mold with a wire grid pattern in contact with the resist film and compressing the mold and resist film together so as to emboss the wire grid pattern in the resist film;

transferring the wire grid pattern in the resist film to the wire grid material on the substrate by etching; and

wherein the wire grid material comprises a dielectric material sandwiched between two metallic materials, wherein the dielectric and metallic materials act in concert to suppress reflection of rejected polarization.

Visovsky et al., however, provide an explicit teaching (see, e.g., Figs. 2A-2E) of bringing a mold (22) with a wire grid pattern (in the same sense that the mold disclosed in the claims of the instant can be said to have a wire grid pattern) in contact with a resist film (21) and compressing the mold and resist film together so as to emboss the wire grid pattern in the resist film (see Fig. 2B), such teaching, when applied to the teaching by Farris of wire grid material 20 on which is deposited resist film 6, further meeting the additionally recited step limitation of transferring the wire grid pattern in the resist film to the wire grid material on the substrate by etching. See Figs. 2A-2E & col. 3, ll. 37-55 in Visovsky et al. & Figs. 5A-5E in Faris. In addition, Kurtz et al. provide an explicit teaching of a wire grid material comprising a dielectric material (e.g. 342 in Fig. 5C) sandwiched between two metallic materials (id., 322 & 324), wherein the wire dielectric and metallic materials act in concert to suppress reflection of rejected polarization. See col. 9, ll. 59-65.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the method of Faris such that a mold with a wire grid pattern be brought into contact with its resist film and compress the mold and resist film together, such method teaching being notoriously old and well-known in the polarizer art and explicitly taught by Visovsky et al., for at least the purpose of producing an efficient wire grid polarizer. It would have likewise been obvious to one having ordinary skill in the art at the time the invention was made to have modified the method of Faris such that its wire grid material comprise a dielectric material sandwiched between two metallic materials, wherein the dielectric and metallic materials act in concert to suppress reflection of rejected polarization, as

explicitly taught by Kurtz et al., for at least the purpose of optimizing the performance (e.g., contrast ratio) of the resulting polarizer.

2. Claims 26-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Siroki (5,757,538) in view of Faris (6,384,971) and Visovsky et al. (6,375,870) and Kurtz et al. (6,532,111).

With regard to claim 26, Siroki discloses the invention as claimed--[a] method of fabricating an integrated optical isolator, comprising:

forming a wire grid polarizer on a first and a second surface of a substrate made of a magneto-optical garnet material, the wire grid polarizer on the first surface being rotated at an angle relative to the wire grid polarizer on the second surface (see Fig. 3); wherein forming the wire grid polarizer on the first and second surfaces of the substrate comprises depositing a wire grid matieral on the respective surface of the substrate (col. 2, ll. 45-49)--**EXCEPT FOR** explicit teachings of the following additionally recited limitations:

wherein forming the wire grid polarizer on the first and second surfaces of the substrate further comprises depositing a resist film on the wire grid material, bringing a mold with a wire grid pattern in contact with the resist film, and compressing the mold and resist film together so as to emboss the wire grid pattern in the resist film, and transferring the wire grid pattern in the resist film to the wire grid material on the substrate by etching; and

wherein the wire grid material deposited on at least one of the first and second surfaces of the substrate comprises a dielectric material sandwiched between two metallic materials, and wherein the dielectric and metallic materials act in concert to suppress reflection of rejected polarization.

Faris, however, expressly discloses a resist film (6) deposited on wire grid material (20), and Visovsky et al. provide an explicit teaching (see, e.g., Figs. 2A-2E) of bringing a mold (22) with a wire grid pattern (in the same sense that the mold disclosed in the claims of the instant can be said to have a wire grid pattern) in contact with a resist film (21) and compressing the mold and resist film together so as to emboss the wire grid pattern in the resist film (see Fig. 2B), such teaching, when applied to the teaching by Faris of wire grid material 20 on which is deposited resist film 6, further meeting the additionally recited step limitation of transferring the wire grid pattern in the resist film to the wire grid material on the substrate by etching. See Figs. 2A-2E & col. 3, ll. 37-55 in Visovsky et al. & Figs. 5A-5E in Faris. In addition, Kurtz et al. provide an explicit teaching of a wire grid material comprising a dielectric material (e.g. 342 in Fig. 5C) sandwiched between two metallic materials (id., 322 & 324), wherein the wire dielectric and metallic materials act in concert to suppress reflection of rejected polarization. See col. 9, ll. 59-65.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the method of Siroki such that, as expressly taught by Faris, a resist film be deposited on its wire grid material; that, as expressly taught by Visovsky et al., a mold with a wire grid pattern be brought into contact with the resist film of the resulting combination; that said mold and resist film be compressed together--such method teaching being notoriously old and well-known in the polarizer art and explicitly taught by Visovsky et al.-- for at least the purpose of achieving an efficient wire grid polarizer. It would have likewise been obvious to one having ordinary skill in the art at the time the invention was made to have modified the method of the combination such that its wire grid material

comprise a dielectric material sandwiched between two metallic materials, wherein the dielectric and metallic materials act in concert to suppress reflection of rejected polarization, as explicitly taught by Kurtz et al., for at least the purpose of optimizing the performance (e.g., contrast ratio) of the resulting polarizer.

With regard to claims 10 & 27, Kurtz et al. disclose wherein the metallic materials are Al. See col. 13, ll. 11-15; also see col. 14, ll. 39-41.

With regard to claims 11 & 28, please see col. 14, ll. 39-42 in Kurtz et al.

With regard to claims 12 & 29, please see col. 3, ll. 37-48 in Visovsky et al.

3. Claims 13 & 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Faris (6,384,971) in view of Visovsky et al. (6,375,870) and Kurtz et al. (6,532,111), as applied above to claims 12 & 29, and further in view of Koseko et al. (5,603,871).

The combination discloses the claimed invention as set forth above EXCEPT FOR an explicit teaching of heating the mold, the resist film and the substrate to a temperature above the glass transition temperature of the thermoplastic polymer prior to contacting the mold with the resist film. Koseko et al., however, variously disclose wherein a plastic base material is heated equal to or higher than a glass transition point (col. 8, ll. 60-64) and a mold and base material (read: *substrate*) are heated approximately (read: more or less) to the glass transition point (col. 40, ll. 22-25). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the method teachings of the combination such that said mold, resist film, and substrate of the combination be heated to a

temperature above the glass transition point--as implicitly, if not explicitly taught by Koseko et al.--for at least the purpose of ensuring that a high-quality polarizer result from said method. (In addition, please see col. 3, ll. 42-49 in Visovsky et al.)

4. Claims 14 & 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Faris (6,384,971) in view of Visovsky et al. (6,375,870) and Kurtz et al. (6,532,111), as applied above to claims 9 and 26, and further in view of Moshrefzadeh (6,391,528).

The combination discloses the claimed invention as set forth above **EXCEPT FOR** the additional teaching wherein an anti-reflective coating is deposited on the substrate prior to depositing the wire grid material on the substrate.

Moshrefzadeh et al., however, expressly teach wherein an antireflective coating may be disposed on one or both sides (*read:* on first and second surfaces) of a substrate of a wire grid polarizer (see col. 4, ll. 43-47). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the invention of the combination such that an anti-reflective coating be applied to the substrate prior to depositing (inherent) the wire grid material on the substrate, as expressly taught by Moshrefzadeh et al., for at least the purpose of enhancing the percentage of non-rejected light (i.e., p-polarized light) that would be transmitted by the substrate.

5. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Faris (6,384,971) in view of Visovsky et al. (6,375,870) and Kurtz et al. (6,532,111), as applied above to claim 9, and further in view of Siroki (5,757,538).

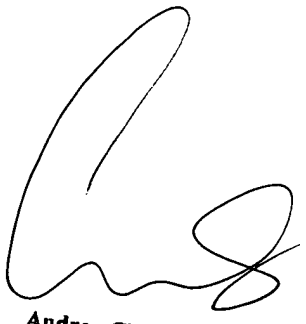
The combination discloses the claimed invention as set forth above **EXCEPT FOR** the additional teaching wherein the substrate is made of a magneto-optical garnet material.

Siroki et al., however, expressly disclose a wire grid polarizer (see Fig. 3) having a substrate (Id. at 1) comprised of magneto-optical garnet material (col. 2, ll. 40-43). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the invention of Kurtz et al. such that said substrate of said wire grid polarizer be made of magneto-optical garnet material, as expressly taught by Siroki et al., for at least the purpose of permitting said wire grid polarizer to function as a Faraday rotator element in an optical isolator.

Contact Information

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Craig Curtis, whose telephone number is (703) 305-0776. The centralized facsimile phone number for the USPTO is (703) 872-9306.

Any inquiry of a general nature regarding to status of this application should be directed to the Group receptionist, whose telephone number is (703) 308-0956.



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7 November 2003